TECHNOLOGY DEPT.

First Copy

A National Newspaper for Every Branch of the Industry

Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

Vol. 13. No. 1734 — Entered as second-class matter Aug. 27, 1925, Post Office, N. Y., N. Y., Under Act of March 3, 1879. — NEW YORK, SATURDAY, MAY 21, 1932 — 5 Cents. $12 Per Year.

Detroit Employment Gains, Passing April and March; Year's Peak Almost Reached

Report Encouraging to Industry, Indicating Upward Trend; Production Holding Up Well Despite Tax Uncertainty

Detroit, May 20.—Improvement in employment in this city during the current week has given a more or less Easter attitude to workers and business men in this section, and, while the index of May 15 stood at 69, as compared with the high for the year of 69.4, each on February 15, the latest figures top the index for April 30, which stood at 67.5, and that of March 15, which was 68.

These figures, of course, are below the index of 84.0 for May 15, last year, but are encouraging in that they represent an upward trend at the present time. Ford's return to production is to be credited with much of this improvement and schedules in many other plants have been stepped upward during the current month.

Pending legislation, with the threat of special excise taxes on automotive products, is a disturbing element at the present time. Makers are at wits' end in attempting to judge their markets for next month due to their inability to determine whether or not the pending sales tax, if passed, will begin to make itself felt immediately.

Production for the current month is holding up well and there are indications that the earlier prophecies of more than 200,000 units this month will be fulfilled. Sales returns so far available for April also bring encouragement with indications that the total for April will be 20 to 25 per cent. above the total for March. On this basis it is likely that April sales will exceed the estimated production during that month of 146,500 units.

DES MOINES FORD PLANT TO ADD 500 MEN MAY 31

Des Moines, Ia., May 20.—G. F. Nelson, manager of the assembly plant of the Ford Motor Company here, announced today that 500 men would be called back to work on May 31. Later the force will be increased to nearly 800.

N. B. M. A. HEARS FOWLER TALK ON TRADE PRACTICES

Chicago, May 20.—Members of the National Battery Manufacturers Association in convention at the Hotel Sherman evinced special interest yesterday in the subject of trade practices as expounded by Henry P. Fowler of the United States Chamber of Commerce.

With R. D. Mowry, president of the association, in the chair, the day's program also included talks by Dan H. Kelly, vice-president Electric Auto-Lite Company; Ward S. Perry, Fairman Perry & Co.; A. A. MacLean, vice-president USL Battery Corporation, and H. A. Harvey, manager of Service Station Sales, USL Battery Corporation.

D. A. Graham of Red Bar Battery Company presented a report of the committee he heads on Federal trade practice. In his talk Mr. Harvey outlined new outlets and methods of merchandising storage batteries, stressing the importance of manufacturers giving consideration to these points in their sales programs.

Today's sessions are being devoted to reports of numerous standing committees, eighteen brief informal talks on various live topics and set addresses by Mr. Graham and E. D. Martin of Emark Battery Corporation.

Newark Dealers Staging Intensive Spring Campaign

Newark, N. J., May 20.—The Newark Automobile Trade Association has started an intensive campaign with newspaper, direct-by-mail and billboard advertising to stimulate new car business during May, June and July.

The Badge of Honor idea for new car purchasers has been brought more forcibly to the front in the issuance of a neat badge in royal blue and gold to be pasted on the windshield of all new cars sold.

Claude E. Holgate, association manager, in a bulletin to member dealers yesterday, says:

"You have probably noticed the painted billboards along Broad Street, in the center of the city, calling attention to the fact that the purchase of a new car at this time is a Badge of Honor. Our thanks are extended to the Prudential Insurance Company for their co-operation with us in granting permission to erect the sign at Broad and Market Streets, one of the busiest corners in the country.

"This plan was decided upon by the special committee appointed by President Alfred De Cozen. But the billboards are only a part of the general plan.

"A neat Badge of Honor, in royal blue and gold, has been prepared and should go on every new car purchased this year. It should be placed outside on the lower right-hand corner (as you sit in the car) of the windshield, on a slight angle.

"A circular explaining why the Badge of Honor has been awarded should also go to each purchaser of a new car, so that he will get the significance of the movement, and help pass the word along."

A sample of the Badge of Honor and the explanatory folder was sent to each member for their information and for the information

(Continued on Page 4)

April New Car Sales 24% Ahead Of March in 34 States and D. C.

Month 53% Behind 1931, but With Ford Beginning To Make Deliveries Sharp Approach to Last Year Seen by June

Detroit, May 20.—Release by R. L. Polk & Co. of figures covering passenger car sales in thirty-four states and the District of Columbia for April, 1932, shows that the total for the month is more than 24 per cent. ahead of that in March, 1932, in the same territory. This gain is higher than was indicated by the first few states to report and is distinctly encouraging in spite of the fact that it is fifty-three and a fraction per cent. under the sales in this territory made in April, 1931.

The sales figures for these thirty-four states and the District for April, 1932, show a total of 70,437 units. This compares with 56,580 in March, 1932, and with 159,723 in April of last year.

These figures show more than ever the importance of Ford sales in the general picture. In this territory this April the total sales of Ford passenger cars were 4,317 units as against 47,908 in the same territory in April, 1931. The difference is 43,691 units. If this loss in the sales of a single car were added to the total for April, 1932, that we now have, the grand total would be 114,028, which would not compare quite so badly with the 159,723 units that were disposed of in April a year ago.

It is not probable that Ford sales to individuals will exert an important influence on the sales total for May this year, but with June we shall begin to note their rising tide. When the June sales figures begin to roll in, early in July, we ought to see the 1932 sales totals begin to make less uncomfortable reading in comparison with similar statistics for last year.

The following are the passenger car sales figures for the thirty-four

(Continued on Page 3)

A. P. SLOAN, JR., JOINS CREDIT EXPANSION GROUP IN NEW YORK

A. P. SLOAN, JR.

New York, May 20.—Alfred P. Sloan, Jr., president of General Motors Corporation, will represent automotive interests on the newly formed credit expansion committee, which is headed by Owen D. Young, chairman of the General Electric Company, Schenectady, N. Y.

Through the formation of this committee financial authorities hope to make the Federal Reserve policy effective and find means for bringing together the vast surplus of idle funds in banks and to make these funds available to many worthy projects, now in need of credit, that exist throughout the country.

The group was called together by George L. Harrison, governor of the Federal Reserve Bank of New York, as New York's response to the policy devised at the meeting of the Federal Reserve Bank governors in Washington earlier in the week.

In the last twelve weeks the Fed-

(Continued on Page 3)

PRICES ARE REDUCED BY SEARS AND WARD

Chicago, May 20.—Midsummer catalogues of Sears-Roebuck and Montgomery Ward, which are being mailed to customers, show reductions in prices of 5 per cent. to 50 per cent. from the levels of last summer.

Montgomery Ward's catalogue shows a 10 per cent. reduction in Riverside Mate 4-ply tires, which are Ward's second line tires. It introduces the Riverside Rambler tire, a new low-priced tire sold in sizes for all cars.

The catalogue in addition introduces a new oil-burning refrigerator for homes without electricity. Company offers this refrigerator at $107.50 cash and states it operates on kerosene for about 3 cents a day.

Sears-Roebuck's Allstate's Companion tires are reduced 10 per cent. from previous levels. These tires are the company's second-line tires and were first introduced about this time last year.

G. E. ANNOUNCES 20% PRICE CUT ON HEADLAMP BULBS

Schenectady, N. Y., May 20.—Price reductions averaging approximately 20 per cent. on automobile lamps manufactured by the General Electric Company were announced today by Gerard Swope, president of the company. The types of lamps affected comprise 80 per cent of the company's automobile lamp business.

The popular double filament 32-candlepower head-light lamp has been reduced more than 30 per cent. from 35 cents to 24 cents. Side and rear lamps have also been reduced and will now sell for ten cents.

This marks another in the long series of reductions in the prices of incandescent lamps which have been put in effect since 1920. The average price of these lamps is now down 59 per cent. from their 1920 prices.

G. M. Tests Prove Safety Of Free Wheeling Cars

New York, May 20.—Since the advent of free wheeling and its almost universal adoption by the industry, the question of whether or not free wheeling is as safe as previous transmissions systems from the standpoint of stopping the car, has been a bugaboo for salesmen and dealers as well. Old-time drivers, accustomed to using the compression of the engine as a retarding force in stopping, were skeptical as to the ability of the braking system to perform properly without the aid of the engine, particularly in emergencies.

Some months ago Automotive Daily News inquired of A. J. Schamehorn, director of the General Motors proving ground, for any information which he had available which might definitely settle this question one way or the other. At the time Mr. Schamehorn had no definite information, but kindly consented to conduct tests and experiments to determine the advantages or disadvantages of leaving the engine in or out of speed when stopping.

These experiments were conducted by Robert McNeal, head of the technical data section at General Motors proving ground, and his complete report is printed herewith. Mr. McNeal's studies reveal that from a layman's point of view the actual difference between leaving the engine in speed with the car or leaving it out, in stopping, affects the actual stopping range of the car so little that it would not be noticeable under normal operating conditions. With the maximum braking effort, at average driving speeds, he finds, however, that the car can be stopped more quickly in free wheeling than with the engine in speed. With only fair brakes, the difference is negligible, and with poor brakes, at speeds about thirty miles an hour, leaving the engine in speed will aid in stopping more quickly.

Mr. McNeal's complete report is as follows:

A MATHEMATICAL STUDY OF THE EFFECT OF ENGINE FRICTION ON THE STOPPING DISTANCE OF AN AUTOMOBILE WITH BRAKES APPLIED.

By ROBERT M'NEAL

Since the introduction of free wheeling there has been consider-

(Continued on Page 5)

CHARLES E. FAY, HEAD OF BOSTON A. D. A., DIES AT 65

Boston, May 20—Charles Edward Fay, president of the Boston Automobile Dealers' Association and prominent in banking and fraternal circles died of apoplexy yesterday afternoon at his home in Watertown.

C. E. Fay

He was born in Cambridge on June 14, 1867. In 1888 he entered the bicycle business, later becoming an executive of the American Bicycle Company. He was president of the old Middlesex Bicycle Club and a leader in the New England Cycle Association.

He became New England manager of the Ford Motor Car Company in 1906 and subsequently the Cambridge plant of the company was built under his direction. In 1917 he started the C. E. Fay Company, dealers for Maxwell and now New England distributor of the Chrysler and Plymouth models.

Mr. Fay was a past president of the Watertown Co-operative Bank, a director of the Union Market National Bank of Watertown and a member of the B. A. A., the Algonquin Club, the City Club, the University Club and the Masons.

He is survived by his widow and three sons; Allan, who was associated in business with him; Norman of Newton and Stuart of Watertown.

GM DIFFERENTIAL PLANT AT SYRACUSE TO STAY

Syracuse, N. Y., May 20.—The persistently circulated report that the Brown-Lipe-Chapin division of the General Motors Corporation would be moved from Syracuse to Flint, Mich., or some other point, is emphatically denied by Alfred P. Sloan, Jr., president of General Motors, who is quoted as saying:

"At the present time we do not contemplate moving our Syracuse plant. I don't know where the report came from, but there is absolutely no truth in it."

The Brown-Lipe-Chapin plant is the largest in the world manufacturing differential gears for the trade. It also produces differential carrier assemblies driving gears, driving pinions and valve tappets.

DISCUSS NEW RUBBER CONTRACTS ON MAY 27

New York, May 20.—The board of governors of the Rubber Exchange of New York, Inc., has called a special meeting of members for May 27 to discuss proposed contracts to be known as "AB" and "No. 1B Standard."

Both provide, in the event a government import tax or duty is in effect, that delivery of the crude rubber be made from a bonded, licensed warehouse, or in bond on dock in New York.

In other respects, the proposed contracts correspond with those now in use.

BAY STATE GAS TAX BILL PASSES HOUSE

Boston, Mass., May 20. — The House of Representatives passed, 65 to 16, a bill continuing the additional 1 cent gasoline tax now in force until 1936. The present additional tax expires in 1933. Opponents said the legislature should wait until then before passing the bill.

Classified Advertising

Classified Rates 5c Per Word

MANUFACTURERS ATTENTION

Representative position wanted with nationally known product or manufacturer in automotive field. New York State or other Eastern territory desired on commission contract basis. Box 297, Automotive Daily News, 350 Hudson Street, New York.

FINANCIAL NEWS

CITIES SERVICE

New York, May 20.—Net to common stock and reserves of Cities Service Company for the first four months of 1932 shows an increase over the similar period of last year. During April, the use of electric current by domestic consumers of subsidiary companies showed a slight increase over April, 1931, and sales of coke from the subsidiaries' manufactured gas plants have increased. Crude oil pipe line transportation facilities showed a slight increase in business during the month. In the thirty days ended May 15, 1932, the number of holders of Cities Service common stock increased 3,618, bringing the total to 532,235. Regular monthly dividend of 50 cents on the preferred and preference BB stocks, 5 cents on the preference B stock, 2½ cents in cash and ½ of 1 per cent. in stock on the common stock were announced, all payable July 1 to stockholders of record June 15.

YOUNGSTOWN DISPUTE

Youngstown, May 20.—Counsel for Cyrus S. Eaton and associates in the Youngstown Sheet & Tube Company-Bethlehem Steel Corporation merger case has filed an attack in the District Court of Appeals against the decision of John T. Scott, Cleveland referee in the merger case appeal. The motion asks the court to instruct Scott to "ascertain the facts on the issues raised and determine and fix a reasonable compensation for attorneys representing the anti-merger interests." Mr. Scott recently gave a decision that there was no fraud in the proposed merger.

INTERSTATE PETROLEUM

New York, May 20.—Interstate Petroleum Company—Year ended December 31: Net income after Federal taxes, depreciation, expenses, depletion and other charges, $76,108, equal to 66 cents a share on 58,047 no par Class A shares outstanding, compared with $298,089, equal after Class A dividend requirements, to $1.33 a share on 137,582 no par Class B common shares outstanding at close of previous year.

NORTH CENTRAL OIL

New York, May 20.—North Central Texas Oil Company, Inc.—Quarter ended March 31: Net profit after depletion, Federal taxes and other charges $7,914 compared with $7,531 in first quarter last year. Capital stock consists of $303,300 6½ per cent. preferred and 262,446 no-par common shares.

PAHANG RUBBER

New York, May 20.—Pahang Rubber Company, Ltd.—Year ended December 31: Net loss after depreciation, expenses and reserves for forest depletion and other charges, $32,185, compared with $16,111 net loss in previous year.

EMPIRE OIL

New York, May 20.—Empire Oil and Refining Company—Year ended November 30: Net loss after depreciation, depletion, interest, amortization and other charges, $4,731,056, against $2,234,734 income in preceding fiscal year.

INDIAN MOTOCYCLE

New York, May 20.—Indian Motocycle Company and subsidiaries—Quarter ended March 31: Net loss after all interest and other charges, $40,882, against $58,630 loss last year; net sales, $315,154, against $421,080.

WOLVERINE BRASS

New York, May 20.—Wolverine Brass Works voted a 50-cent quarterly on the common stock, payable May 15 to holders of record of the same date, reducing the dividend from $1 a share paid February 15.

WORLD ZINC PRODUCTION IN APRIL OFF 4,376 TONS

New York, May 20.—World zinc production in April totaled 75,827 short tons, against 80,203 tons in March and 102,889 tons in April, 1931, according to American Bureau of Metal Statistics. Production in United States in April was 20,620 tons, against 22,493 tons in March.

Daily average for world zinc output in April was 2,528 short tons, lowest in many years, compared with 2,587 in March and 3,430 tons in April, 1931.

INCREASE SELECTIVITY OF CHRYSLER CONTROL

Detroit, May 20.—Selective dash control on all Chrysler Six, Eight and Imperial Eight models permits three separate combinations of free wheeling and automatic clutch. Now the driver may have both free wheeling and automatic clutch in operation; free wheeling without automatic clutch; or conventional gear without either free wheeling or automatic clutch.

There has been no change in the dash control button to accomplish this additional selectivity. When the button is pushed to the "in" position both free wheeling and automatic clutch are operating as in the past. To exclude the automatic clutch feature, but retain free wheeling, the button is pulled to a "half-way" notch. Then, if the driver wishes to eliminate both features the control button is pulled all the way "out" as formerly.

Complete selectivity of the free wheeling and automatic clutch features is said to add to the flexibility of operation and to make the control of a car thus equipped more positive.

INDUSTRIAL SESSIONS SET FOR JUNE 18-19

Newton, N. J., May 20.—The seventh annual session of the New Jersey Industrial Conference will be held June 18 and 19 at Camp New Wawayanda, near here.

"Security of Employment" will be the theme of this year's conference. The purpose of the conferences is to bring together representative industrial men for discussion of problems and exchange of experiences.

Addresses will be made by industrial leaders from New York and New Jersey. Stanley S. Holmes, vice-president of the Western Electric Company, in charge of the Kearny plant, will speak in the afternoon.

Roy V. Wright, managing editor of Railway Age, will speak the morning of June 19. Officers will be chosen at the dinner session that day. Mr. Schwarz is chairman of this year's committee, Edward E. Lewis of the Eclipse Aviation Corporation, vice-chairman: Warren L. Duncan, secretary, and Andrew Wielenga of Haledon, treasurer.

STUTZ ANNOUNCES TWO LOWER PRICED MODELS

Indianapolis, May 20.—The Stutz Motor Car Company, in a preliminary announcement to its dealer organization, states that production is scheduled to start immediately on two new and additional lines of cars as part of their 1933 program.

The two new models will be known as the Challenger Stutz CS-16 and Challenger Stutz CD-32. These cars will be offered at the lowest price at which a Stutz eight-cylinder car has ever been offered. The reduction in price has been made possible entirely by production economies and no change has been made in the quality of the cars, the announcement states.

LITTLE ADDS COOKERLY TO GMC SALES STAFF

Pontiac, Mich., May 20.—T. B. Cockerly, Jr., Chicago zone manager for General Motors Truck Company, has been appointed to his staff as manager of the wholesale distribution division, Joseph P. Little, vice-president and director of sales, has announced.

W. C. Makinney, formerly Chicago zone retail sales manager, will succeed Cookerly in Chicago.

At the same time it was learned Herbert H. Henchel, formerly general manager of General Motors Truck and Coach of Canada, Ltd. had been appointed to Mr. Little's staff as used truck manager.

2 ADDED TO MENGEL BOARD; COMMON STOCK PAR SET

Louisville, Ky., May 20.—Officers and directors of the Mengel Company were re-elected at the annual meeting, while Frank Borries, Louisville, and A. W. Cornwall, Winston-Salem, N. C., division managers, were added to the board. No par value common stock was changed to $1 par and $7,680,000 was transferred to the surplus account.

SPARKS *from* DETROIT

Pierce-Arrow Celebrates
* * *
Carl Parker at Reo
* * *
Edsel Ford, Pacemaker
* * *
Racing Ripleys
* * *
Count Sahnoffsky
* * *

Chris Sinsabaugh—Detroit Editor

PIERCE-ARROW sorta looks on the column as the historian of the automobile industry evidently, for I am favored with a pictorial display of the different models this veteran company has manufactured since it first started operations in 1901. Why the shouting? Because this is the thirty-first anniversary of the Buffalo concern. And in this industry thirty-one years is a long, long time.

* * *

AS A HISTORIAN, I can recall the first Pierce-Arrow, nothing but a one-cylinder 2¾ horse power motorette, but the very foundation of the Pierce-Arrow structure. The first-born is still alive and hops around in lively fashion when taken out on the road nowadays. What a contrast with the present Pierce-Arrow, with its eight and twelve-cylinder engines, 125 to 150 horse power, and all the latest doodads and luxuries!

* * *

THE PIERCE-ARROW model that intrigues me, though, is the 1914 convertible, which marked the year of the adoption of the famous fender headlamps, which are the one sure way of identifying the product. I learn something about that convertible that maybe old timers have forgotten. Being a high priced job, and a millionaire's dream, it had all the conveniences of a bathroom, with the sole exception of the bathtub itself, in the capacious tonneau—a washbowl and other conveniences, the water being supplied from a pressure tank.

* * *

REO WELCOMES the return to his old desk at the plant of Carl Parker, who was in charge of affairs when Reo first started making commercial vehicles, back in 1911. Parker comes back to the old job, and from now on will be in command of truck activities.

Parker is responsible for coining a name for Reo that has aided materially in Reo truck sales. He it was who dug up Speedwagon as the name for the company's light truck, in 1911, which fitted the product like a glove.

* * *

YOU'VE HEARD that Edsel Ford is to drive the pace-making car in the Indianapolis race on May 30, but the speedway announcement neglected to give the make of the car. Probably it won't surprise you to be told that the pacemaker is to be a Lincoln.

* * *

OTTIS LUCAS, advertising manager of Studebaker, sends me a Ripley which he has dug up from last year's Indianapolis race. Of course it has a Studebaker slant, for Lucas is a race fan these days, with Studebaker having five cars in this year's classic.

The Ripley is that Tony Gulotta, in a Studebaker motored car, led the 1931 race, but never was in first place. How come? Well, Tony was trailing Billy Arnold, who was four laps to the good and seemed to have the race cinched. Arnold crashed, which left Gulotta in the lead, but not in first place. Tony kept a-plugginfg and had made up all of the four laps but 200 yards, when he went into the retaining wall and was out.

This unusual phase of the race is certified to by Chester Ricker, director of timing at Indianapolis.

* * *

COUNT ALEXIS SAHNOFFSKY, world famous body stylist, has the itching foot, and is planning to get away for a month's trip to Europe, to get a line on what his rivals on the other side of the big pond are doing. The count sails early next month and will return in July.

FORD RECALLS 700 AT INDIANAPOLIS PLANT

Indianapolis, Ind., May 20.—Seven hundred workmen were recalled to the local plant of the Ford Motor Company last week, when production on the new line of cars and trucks got under way. A group of dealers from the Indianapolis territory were on hand to see the first car come off the line.

Full-time operations are scheduled for the current month, it was announced by Ford officials here, although the daily rate of production was not made known. It was stated, however, that former peaks would not be reached for some time, due to the change in models and consequent disturbance to the production line.

Only former employees are being reinstated, and it was calculated the force would be materially increased as the local factory swung into a faster pace. Peak operations during recent years after improvements were made at the plant made possible a daily output of 200 cars and trucks with a staff of about eleven hundred workmen employed. Present output is estimated at about 125 cars daily.

The branch reported sufficient volume of orders on hand to insure steady operations for a considerable period, and, pending higher rate of output, states dealers served by the local plant are receiving some cars from other branches.

Retail Salesmen—This Is Your Page

This department is devoted to the interests of the retail sales division of the industry. Salesmen, this is your department. Automotive Daily News wants you to get something from this department that will help you in your work on the firing line. It wants you to pass on your own experiences, successes, failures to help your brother salesmen. Send in your story in the form of a letter, or even a postal card, and let us get it ready for publication. Your achievement or your mistake may help another salesman to make sales or avoid errors that cost you commissions.

Dealers read this page. Give us the benefit of your reactions on these problems that affect the work of your salesmen, the men on the firing line, the men who bring home the bacon or don't.

ENCOURAGES HIS SALESMEN TO MEMORIZE ANSWERS FOR ALL QUESTIONS

C. B. Warren, president of the Warren-Nash Motor Corporation, who is a thorough believer in a completely memorized talk for salesmen, is also an advocate of a memorized answer to every question that may be asked by a prospect. For some time Warren-Nash has encouraged salesmen to learn by heart well-phrased answers to the customer's natural queries.

And a new Nash sales booklet, now in the hands of salesmen in New York and other parts of the country, is almost entirely devoted to questions about the Nash and their answers. The booklet, entitled "Facts About the New Nash," is handsomely bound in red. It lists twenty "improvements in appearance," thirty-five "outstanding engineering features" and thirty-three "outstanding body features."

The remainder of the booklet is given over entirely to sixty questions and answers.

Salesmen at the Warren-Nash plant in New York are drilled on these Q. and A.'s. And executives have noticed that one salesman who often repeats the exact words of the book in answer to the questions is the man with perhaps the most outstanding sales performance recently.

The sixty questions and answers tell the Nash story completely in about 3,000 words. They represent a somewhat novel approach to the problem of how to teach the salesman to respond quickly with the exact information the customer wants.

Some of the questions and answers follow:

Q. Is Nash powered by high compression engines?

A. Yes. All Nash engines are high-compression and are engineered to use any type of gasoline and to give maximum performance.

Q. What are the advantages of the underslung worm-drive axles in the Ambassador 8, Advance 8 and Special 8?

A. Worm drive is extremely silent in operation. It is long lived and improves with use. Its underslung design permits the lowering of the car's center of gravity without decreasing headroom or passenger comfort. Because the worm is underslung, its very action makes lubrication of the axle positive and constant.

Q. How long has worm drive been in automotive use?

A. Automotive worm gearing dates from the year 1913, and has been used on thousands of motor vehicles. Records of 500,000 mileages with one set of worm gearing are quite common. It is one of the longest-lived and most trouble-free units known in motor car engineering.

Q. Does worm drive adapt itself to highest speeds?

A. Yes. One of the world's fastest cars at Daytona Beach employed worm-drive axles. Several speed records for transcontinental runs are held by worm-drive axle vehicles. The fastest motor coaches, traveling 300 to 500 miles per day at high speed, use worm-drive axles.

Q. How does Nash "slip-stream" body construction increase riding qualities?

A. Because of the advanced design of the new bodies, the rear seat is located well ahead of the rear axle instead of directly over it, as in conventional practice. With both seats thus located between front and rear axles—away from any possible contact with axle mechanism—a "cradled" riding action is produced which adds greatly to passengers' comfort and increases roadability of the car.

Q. What further advantages are provided by the "beaver-tail" back, sloping wind shield, V-type radiator and body taper of the new Nash "slip-stream" body?

A. These pleasing new Nash body lines serve to reduce air resistance, eliminating retarding action of the rear end vacuum, thereby making possible greater speeds and also imparting a smart speed line effect.

Q. What are the benefits of new drop center rims?

A. They enable Nash to use smaller and sturdier wood and wire demountable wheels, with larger tires. The small wheels and large tires add to the appearance of the car, as well as serve to hold the car close to the road, affording greater safety.

Q. Why does Nash locate starter button on dash and not on floor?

A. Starter on dash is easy of access. It keeps the floorboard clear; leaves feet free to operate brake and clutch pedals. This location, unlike that on floorboard, makes it possible for Nash dealers to install Startix at slight extra charge.

Q. What is the advantage of the new concealed-type hood fasteners?

A. Fasteners for each side are operated by a remote control lever, which adds to convenience of opening hood and eliminates unsightly hood latches.

Q. Why is the Nash chassis so completely insulated with rubber?

A. Live rubber cushioning is used at every available strategic point on the Nash chassis to prevent metal-to-metal contact and to add to the luxurious riding qualities which a Nash sound-proofed body provides. Rubber insulation dampens vibration, reduces friction and lengthens car's life.

Q. Why isn't twin ignition used in the Standard 8 and Big 6?

A. Twin ignition engineering can be incorporated only in valve-in-head and T-head engines.

Q. Why does Nash follow the expensive practice of drilling all connecting rods full length for oil?

A. To assure proper lubrication, under high pressure, to the piston pins, thus preventing wear on piston pins and increasing the efficiency of the engine.

Q. What are the advantages of aluminum pistons, aluminum connecting rods and hollowed crank pins?

A. Light reciprocating parts, increased acceleration and performance and greatly prolonged engine life.

Q. What are the advantages of the new dual muffler?

A. New dual muffler has a resonator type exhaust silencer which has been installed at considerable expense and is the newest advancement in silent engineering. Virtually eliminates all motor noise and back pressure. Exhaust travels in straight line instead of through conventional baffle plate muffler.

A. P. SLOAN, JR., JOINS CREDIT EXPANSION GROUP IN NEW YORK

(Continued from Page 1)

eral Reserve system has purchased $725,000,000 of United States government securities, putting into the market funds capable of supporting $7,250,000,000 of bank credit. But in spite of this enormous expansion of available funds, the deflation of bank loans and investments has been unchecked. Fear and uncertainty on the part of bankers and the investing public alike have prevented the Reserve's policy from taking its full effects. In the face of this delay a demand has arisen in many quarters for more drastic means of stimulating a recovery in prices.

The membership of the committee, as announced by Mr. Harrison, follows:

Owen D. Young, chairman General Electric Company, chairman.

Mortimer N. Buckner, chairman New York Trust Company.

Floyd L. Carlisle, chairman Consolidated Gas Company.

Walter B. Gifford, president American Telephone and Telegraph Company.

Charles E. Mitchell, chairman National City Bank.

William C. Potter, president Guaranty Trust Company.

Jackson E. Reynolds, president First National Bank.

Alfred P. Sloan, Jr., president General Motors Corporation.

Walter C. Teagle, president Standard Oil Company of New Jersey.

A. A. Tilney, chairman, Bankers Trust Company.

Albert H. Wiggin, chairman of governing board, Chase National Bank.

Clarence M. Woolley, chairman American Radiator and Standard Sanitary Corporation.

TWO NEW DEPARTURE PLANTS TO BE MERGED

Bristol, Conn., May 20.—De Witt Page, president of the New Departure Manufacturing Company, announced that the Elmwood division, employing about 350 men at present, will be consolidated with the plant in Meriden. The transfer of operations will be gradual, with no definite date set.

"This move will be made because it is considered advisable during the uncertain period ahead to centralize operations by the amalgamation of these plants. No changes are contemplated at Bristol," President Page's statement read.

Ball bearings are produced at the Elmwood plant, which is located in the Hartford suburb of that name. The plant is known officially as the Hartford division, but is generally referred to as the Elmwood plant, due to its location.

GENERAL MOTORS DEALERS IN VANCOUVER BREAKFAST

Vancouver, B. C., May 20.—General Motors Products of Canada, Ltd., dealers from Vancouver and New Westminster, recently held a successful breakfast meeting in Vancouver. T. G. Applegath, zone manager, presided, and J. W. Elliott, zone sales promotion manager, outlined the "87" sales promotion plan of the company, which is based on the fact that the sale of one car means an average of eighty-seven days employment for a worker.

OLNEY MOTORS CLOSES 8 CASH SALES DURING APRIL

Philadelphia, May 20.—Eight cash sales, representing straight deals—no trade-ins—were swung in the month of April by Olney Motors, Chrysler and Plymouth dealership, 5436 North 5th St., in addition to sales with acceptance of accompanying exchange cars. In the last two months the firm has disposed of about eighty-five new cars.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

CANADA REAPS HARVEST IN U. S. TOURIST TRADE

Toronto, Canada, May 20 (UTPS). Service station owners, automotive accessory dealers and garage men have received close to half a billion dollars as their share of the business of catering to the automotive needs of the American tourist trade since 1920, reports the Dominion Statistical Bureau.

The statement shows that the Canadian men in the service, accessory and garage business benefited to the extent of $250,776,000 in trade derived in 1931 alone from American tourists. The American Automobile Association estimates that American motorists will spend $285,000,000 in Canada during the present summer.

THREE MAKERS NAME DEALERS IN CHICAGO

Chicago, May 20.—The addition of new dealers is announced at Dodge, De Soto and Reo headquarters here. Robert M. Foley & Co. has been appointed a north side Dodge and Plymouth dealer, located at 3817 Lawrence Ave. Robert Hanke has been named in the same capacity for Reo, with headquarters at 5714 Broadway. The new De Soto dealer is the Sampson Motor Sales, on the west side, at 3845 West Madison St.

All of these firms and individuals have been identified with retail sales activities in Chicago for years.

CHRYSLER DEALERS HOLD DINNER AND MEETING

Springfield, Mass., May 20.—Chrysler, De Soto and Dodge dealers of Springfield and vicinity were guests at a dinner and informal meeting in the Hotel Kimball last night, as part of a nation-wide series of similar meetings being held this week. More than 400 dealers and members of their organziations attended this function, which was in charge of G. Ray Smith, Plymouth sales promotion supervisor for this district.

B. E. Hutchinson, chairman of the board, Plymouth Motor Corporation; J. W. Frazer, general sales manager, Chrysler Sales Corporation, and S. W. Munroe, director of Plymouth sales, were the principal speakers.

NEW SUPPLIES DEALER

Plainfield, N. J., May 20.—Motor Boys, Inc., of 9 Watchung Ave., Plainfield, filed articles of incorporation to deal in automotive supplies.

APRIL NEW CAR SALES 24% AHEAD OF MARCH IN 34 STATES AND D. C.

(Continued from Page 1)

states and the District of Columbia, which have so far reported:

States.	Apr.,'32.	Apr.,'31.	Mar.,'32.
Arizona ...	155	340	187
Arkansas ..	409	964	324
Conn	2,326	4,834	1,645
Delaware ..	341	690	301
Florida	847	2,575	1,096
Idaho	242	649	216
Illinois	7,982	17,004	5,376
Indiana ...	3,696	9,391	2,638
Iowa	2,525	6,522	1,387
Kansas ...	1,042	3,777	872
Maryland .	1,860	3,738	1,499
Michigan ..	5,116	14,166	4,318
Minnesota..	3,231	7,816	2,459
Missouri ...	4,024	6,886	6,683
Montana ..	702	1,108	697
Nebraska ..	1,442	3,610	920
Nevada ...	172	235	137
New Hamp.	821	1,844	490
New Mex .	229	558	88
Nor. Car...	1,427	3,249	774
Nor. Dak...	524	1,400	261
Ohio	7,307	17,736	5,088
Oklahoma..	1,639	2,909	957
Oregon	740	1,851	512
Penna	9,962	19,947	8,518
Rhode Isl..	1,097	1,988	770
S. Carolina.	657	1,746	373
S. Dakota..	410	1,190	385
Utah	281	887	350
Vermont ..	538	1,213	282
Virginia ...	1,758	3,878	1,426
Washington	1,281	2,613	1,192
West Va...	1,183	2,674	668
Wisconsin .	3,064	6,727	2,568
D. of Col..	1,407	3,008	1,123
Totals ..	*70,437	159,723	56,580

*Gain.

N. J. PLANS SALES TAX INSTEAD OF GAS LEVY

Trention, N. J.,—May 20.—At the suggestion of former Gov. Edward C. Stokes, chairman of the board of the First-Mechanics National Bank of Trenton, a general sales tax, instead of an additional levy on gasoline, for unemployment relief was endorsed yesterday by Gov. Moore, legislative leaders, bankers and industrialists. The proposal will be submitted to a bi-partisan committee of the Senate and House of Assembly next Monday.

As outlined by Mr. Stokes, a general sales tax of 1 per cent. would produce about $18,000,000 a year. The proposed 2 cent increase in the gasoline tax has been estimated to yield about $12,000,000.

Have you a message for Engineers?

Engineers and production men of the industry will gather at White Sulphur Springs, June 12 to 17, for the summer meeting of the S. A. E.

Each day *Automotive Daily News* will cover the meeting editorially. Copies will be mailed to all important engineers, production men and other factory officials in the industry in addition to those who attend the meeting.

Please send space reservations early. Forms close two days preceding publication.

Automotive Daily News

H. A. TARANTOUS, *Bus. Mgr.*, 350 HUDSON STREET, N. Y. C.
DETROIT OFFICE: Geo. M. Slocum, Manager
Fisher Building, Detroit, Mich.
WESTERN OFFICE: Willard R. Cotton, Manager
333 No. Michigan Ave., Chicago, Ill.

Automotive Daily News

"Of, By and For the Entire Automotive Industry"

Published Every Day Except Sunday and Monday by
AUTOMOTIVE DAILY NEWS PUBLISHING CORPORATION
350 Hudson St., New York, N. Y.

O. J. Elder, President. H. A. Tarantous, Vice-President. Alexander Johnston, Secretary
Entered as second-class matter August 27, 1925, at the post office at New York, N. Y., under the Act of March 3, 1879.
350 Hudson St., New York, N. Y. Telephone CA nal 6-1000

MEMBER A. B. C.
Mail subscriptions to CIRCULATION DEPARTMENT 1926 Broadway.
Telephone TR afalgar 7-4500

Subscription Rates. One year, $12.00; two years, $20.00 for United States and Canada also Mexico, Cuba and Panama
To Other Countries, One Year, $15.00; two years, $26.00. Single copies 5 cents.

SATURDAY, MAY 21, 1932

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A Constructive Suggestion

GERARD SWOPE, president of the General Electric Company, has been awarded the gold medal of the National Institute of Social Sciences for his efforts to stabilize employment. Mr. Swope's plan for insuring employment, as well as the work done by his company in stabilizing its employees' employment, undoubtedly brought him this honor. Automotive Daily News presented Mr. Swope's plan at the time he first offered it.

In accepting the medal award Mr. Swope said: "Normally we have about 45,000,000 people gainfully employed. Today probably 8,000,000 or 9,000,000 are unemployed. If all the work were more equitably divided, each one should have at least half-time occupation.

"Constructive and productive enterprises of lasting benefit to the people should be undertaken by the city, state and Federal governments, and, if necessary, the Federal government should assist in financing the others. Employment in such work should not exceed thirty hours per week."

Here is a concrete suggestion which is worthy of earnest consideration. Automotive Daily News long since suggested that the Federal government float a $5,000,000,000 loan to be used in building more highways. We noted recently that Edward A. Filene of Boston advocated exactly this measure for getting the unemployed back to work.

Our reason for suggesting highway building as the method of expending any money raised is that highways invariably bring a return on the investment. Other methods of spending public money often do not. The Holland Tunnel, which connects the city of New York with Jersey city, was built with money supplied by the states of New York and New Jersey. It has returned a far greater income than was expected when it was built. Within a comparatively short time this underwater connection between two states will have been completely paid for without painful taxation to finance it. It would be possible for state and Federal governments to finance many other highway links that would be equally as profitable to the people.

But, more than all else, the country will be well advised to heed Mr. Swope's plea for stabilization of employment. The time to prepare for this is now, so that plans may be carried through in the more prosperous times that will follow the present depression. If we wait until prosperity is here, there is danger that we shall again turn careless and trust to luck, as in the past. If we do this very human but very foolish thing, our next period of depression may not find the sufferers as patient as they have been this time.

It Pays to Advertise

THERE is money in this country and it can be drawn out of its bombproof shelter if effective means are employed. Obviously enough the most effective means is advertising, properly directed to achieve the end its proponents have in view.

A case very much in point recently came to our attention. Up in Boston the Houghton & Dutton department store recently staged a "Houghton Day" sale, which is more or less of an annual affair. This year the management of the store decided to go in heavily, that is to say, more heavily than usual, in advertising this special sale. Big newspaper space was taken. In one case the store used a twelve-page section of an evening newspaper in advertising the wares that were to go on sale at special prices.

The net result was a sales total for the day of more than $225,000. This compares with an approximate $56,000 for the same sale staged last year, which in general was a more prosperous period than 1932 has so far shown itself to be.

If American business could be persuaded to invest its money in properly directed advertising, there would promptly be a change on the face of the business waters.

Trade Association News

Vancouver A. D. A. Endorses Spring Show After Tryout

Vancouver, B. C., May 20.—Fifty cars were sold and a wealth of contacts made which are expected to lead to ultimate sales as a result of the spring automobile show held here recently by the Vancouver Automobile Dealers Association.

Desirable as this result was, it is not considered the most important outcome of the enterprise. The Vancouver organization places first the re-establishment of public confidence, and the creating of public opinion in favor of more steady expenditure and less hoarding.

The show was undertaken with a certain amount of tribulation by the organization. It was arranged by the Vancouver Automobile Dealers Association and sponsored by the Vancouver Daily Province. The Vancouver Exhibition Association also gambled on the success of the venture by permitting use of the exhibition grounds and buildings. Now every one associated in any way with the project is satisfied and in every respect the show was a success.

When the show was finally agreed upon it was decided to stage it on the most elaborate possible scale. The large automobile building at Hastings Park exhibition ground was transformed into a tropical scene by banks of richly colored blooms. Tall palms were grouped about the floor. In this colorful setting every car offered on the market in Vancouver was represented by a varied display.

The show was held during the end of April, and while later than such events are usually held, was considered superior to all previous shows in Vancouver. In the past many dealers had not received their new models from the East, but this year all had the latest models on display.

In addition to stabilizing the automobile industry on the lower mainland of British Columbia, the show aided many other lines. The dealers permitted one of the large department stores to stage a fashion parade each evening. A bathing beauty parade and other similar features were arranged. These not only proved drawing cards, but also helped other lines of business, and the dealers believe that as a result of the general business improvement the show will produce far-reaching results.

Much of the credit for the success of the show is due to Mack Bowell, president, Bowell McDonald Motors, and A. C. Walmsley, Auburn distributor at Vancouver, who formed the show committee with R. O. Fry, Stonehouse Motors, and president of the association, and Walter Welsford, association secretary.

Firms participating, together with the lines they showed, are as follows: Begbie, Carter & White, Chevrolet; Knight Motors, Ltd., Chevrolet; Begg Motor Company, Plymouth, De Soto, Chrysler and Dodge; Bingham Tyrwhitt Motors, Ltd., Graham; Bowell McDonald Motor Company, Ltd., Pontiac; Clarke Parsons Buick, Ltd., McLauhglin - Buick; Confederation Motor Company, Ltd., Auburn; Consolidated Motor Company, Ltd., Willys and Willys-Overland, Hupmobile and Packard; Gray Campbell, Ltd., Frontenac and Durant; McCullough Motor Co., Ltd., Oldsmobile; Southard Motors, Ltd., Hudson-Essex; Stonehouse Motors, Ltd., and Vancouver Motors, Ltd., Ford.

An admission fee of 25 cents was charged, and despite this 25,000 persons visited the show during the first five days.

Portland (Ore.) A. D. A. Has Two Campaigns Under Way

Adoption of a policy by local newspapers restricting used car advertisements to single-column width and an effort to save car dealers from paying intangible tax on repossession reserve income are two of the current activities of the Automobile Dealers' Association of Portland, Ore.

At various times during the past few years Portland car dealers have engaged in an orgy of used car display advertising in the classified columns, enormously increasing the advertising cost per car sold. After months of determined effort, one leading newspaper has adopted the policy of restricting all classified ads to single-column width, and other newspapers are expected to follow suit.

A season of automotive golf, monthly tournaments sponsored by the Automobile Dealers' Association of Portland, was auspiciously opened on May 4 at the Tualatin Country Club, with more than fifty leading automotive men of the city participating. The committee on arrangements comprised H. L. Frank, Frank Chevrolet Company; E. E. Cohen, Oldsmobile Company of Oregon; C. E. Francis, Francis Motor Car Company, and Charles W. Wentworth, Wentworth & Irwin, Inc.

Edward E. Cohen, president of the Automobile Dealers' Association of Portland, pioneer automobile dealer of the Rose City and the oldest Oldsmobile distributor in the United States, is retiring from the industry. On May 2 his business, the Oldsmobile Company of Oregon, was sold to the Buick-Olds-Pontiac Sales Company.

Newark Dealers Staging Intensive Spring Campaign

(Continued from Page 1)

of their salesmen. Mr. Holgate suggested that employees should be called together and the circular read to them by the dealers. Continuing he said:

"The billboard campaign will last for three months—May, June and July. Please check over the number of cars you have sold since the first of the year, and add to them those you expect to sell for the next two months, and let us know how many of the badges and folders you will require. The supply we have on hand is limited by our estimate of the volume of business it is expected will be done in this market, so do not order more than you need for actual sales.

"Every new car on your showroom floor should carry one of these badges. Under no circumstances are they to be placed on used cars, except demonstrators.

"These badges and folders will cost you nothing. This is just another association activity to help the industry. In addition, if there is a sufficient demand for it from dealers we will prepare a digest of the facts contained in the large folder, in such form that it can be used as an envelope stuffer, to go out to all prospect lists, with your bills and other mail you will be sending out.

"If you will let us know how many thousands of these small envelope stuffers you will need, we will order them for you from the printer, with your name and address printed thereon, at net cost to you.

"It is unnecessary to explain that the purpose of this campaign is to overcome sales resistance due to fear of criticism for the purchase of a new car, when, as a matter of fact, purchasers should be praised for their efforts to help end unemployment and bring back business to normal."

COMING EVENTS

MAY

23-28—**Chicago, Ill.** Radio Manufacturers Association, meeting. Hotel Sherman.

JUNE

Paris, France.—International Automobile Manufacturers Association sixth annual Motor Transport Congress.

1- 3—**Tulsa, Okla.** American Petroleum Institute, mid-year meeting, Mayo Hotel.

8-11—**State College, Pa.** American Society of Mechanical Engineers, National Oil and Gas Meeting.

12-17—**White Sulphur Springs, W. Va.** Society of Automotive Engineers, summer meeting.

20-24—**Chicago, Ill.** Motor and Equipment Wholesalers Association, Edgewater Beach Hotel, summer conference.

20-24—**Atlantic City, N. J.** American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall.

JULY

3—**France.** Grand Prix Automobile Race.

5- 9—**Southampton, England.** Commercial Car Show.

9-10—**Belgium.** Grand Prix Automobile Race.

17—**Germany.** Grand Prix Automobile Race.

20-22—**Llandrinded, Wales.** Commercial Car Show.

OCTOBER

3- 7—**Washington, D. C.** National Safety Council, meeting.

3- 7—**Buffalo, N. Y.** National Metal Exposition, 174th Regiment Armory. W. H. Eisenman, 7016 Euclid Ave., Cleveland, director.

3- 7—**Buffalo, N. Y.** National Metal Congress. Sponsored by American Society for Steel Treating, with cooperation of American Society of Mechanical Engineers, Institute of Metals and Iron and Steel Divisions of American Institute of Mining and Metallurgical Engineers, American Welding Society, Wire Association.

13-22—**London, England.** Olympia Show.

WARNS AGAINST INSURANCE FOR "FICTITIOUS" FLEETS

Philadelphia, May 20.—A warning has been issued by Charles F. Armstrong, insurance commissioner, to all casualty insurance companies and reciprocal exchanges against issuing fleet automobile policies covering automobiles of more than one owner. Under Pennsylvania law, according to the commissioner, the writing of such policies is illegal, because the owners of cars covered by them are insured at lower rates than those paid by individuals in the same cassification who are not members of a group so insured. The act of 1931 prohibits discrimination in rates for various policies of insurance, making violators subject to a fine. Rumors that some concerns were writing "fictitious" fleet policies prompted the commissioner's warning.

RUBBER FIRM STARTS HUGE "CO-OP" GARDEN

Akron, May 20.—One of the most ambitious industrial co-operative gardening projects ever attempted has been announced by the B. F. Goodrich Company. Designed as a program by which former Goodrich employees and part-time employees of the company will be given an opportunity to raise their own vegetables, a tract of 275 acres has been obtained and put to cultivation near Akron. Workers on this 275-acre garden will receive shares of the produce in proportion to the time individually expended.

OIL TRADES ASSOCIATION PLANS OUTING ON JUNE 15

New York, May 20.—Joseph C. Smith, secretary of the Oil Trades Association of New York, announced yesterday that that organization would hold its annual outing at Briarcliff Lodge on June 15. Many members have already made reservations and the indications are that the turnout will be one of the largest on record.

On September 15 the association's golf tournament will be held at the Pelham Country Club, while on October 18 the annual banquet will again be held at the Hotel Waldorf-Astoria.

Production--Engineering--Factory

G. M. Tests Prove Safety Of Free Wheeling Cars

(Continued from Page 1)

able discussion about the effect of engine resistance on the stopping distance, some saying that the stopping distance would be increased by leaving the engine in, due to the stored energy in the rotating parts, and others claiming that engine-friction resistance would always act to decrease the stopping distance.

Analyzing the problem on a physical basis, it would seem that, for a given braking force, with engine in, the additional effective weight due to the rotating engine parts would decrease the deceleration at low and moderate speeds, while engine friction would become so high at high speeds that the deceleration would be increased over that with the engine out. Hence, when braking at low and moderate speeds, it would be advantageous to leave the engine out and at high speeds advantageous to leave the engine in if low-stopping distances only are considered.

As the results of some brief tests indicated very little difference in stopping distance with the engine in or out for severe brake applications, it was thought advisable to make a mathematical study of the stopping distances for a wide range of speeds and brake decelerations, using a car for which very accurate data were available on wind, rolling and engine-friction resistances.

The theory on which the study is based is as follows:

When a car coasts along in neutral its motion is resisted by wind and rolling-resistance forces, the law for which is given by $a+bv^2$ pounds.

The effect of a brake application of constant amount is to increase "a" in the above equation. Hence the differential equation of motion of the car is given by

$$\frac{dv}{dt} = -(A+Bv^2)$$

Where v=velocity ft./sec.
t=time seconds

A and B constants obtained by dividing a and b by the car mass.

By integration we have that the distance covered in going from an initial speed of V_0 ft./sec. down to zero speed is given by the equation

$$s = \frac{1}{2B} \log \frac{A+BV_0^2}{A}$$

Engine friction varies according to the law

$$a,+b,v+c,v^2$$

hence with the engine in the equation of motion is given by

$$\frac{dv}{at} = -(A+Bv+Cv^2)$$

where A, B, C are obtained as before by dividing through by the car mass. Effect of brake application is as before to increase A by a constant amount.

By integration we have that the stopping distance in this case from an initial speed of V_0 ft./sec. is given by the equation

$$s = \frac{1}{2C} \log \frac{A+BV_0+CV_0^2}{A}$$

$$B - \text{TAN}^{-1} \frac{2A+BV_0}{V_0 \text{ times the sq. root of } 4AC-B^2}$$

$$\text{C times the sq. root of } 4AC-B^2$$

The weights of the car chosen for this study are as follows:

	Engine Out	Engine In
Curb weight	4,735	4,735
Passenger load (assumed)	450	450
Increased weight due to moment of inertia of crank shaft and fly wheel	...	251.1
Increased weight due to moment of inertia of wheels	168.5	168.5
Total	5,353.5	5,604.6
Mass (g-pounds)	166.465	174.272

The wind and rolling resistances of this car are as follows:

$$62 + .026743\ v^2 \text{ lbs.}$$

The engine friction force is given by the equation

$$43 + 2.15V + .00155V^2 \text{ lbs.}$$

Brake decelerating forces were chosen corresponding to 25, 20 and 15 ft. / sec.^{2} due to the brakes alone with the engine out. These figures correspond to maximum braking effect of good, fair and poor brakes.

The corresponding braking forces in lbs. are: 4162, 3329 and 2497.

The corresponding equations of motion are:

Engine out—

25 ft./sec.^{2} brake deceleration

$$166.465 \frac{dv}{dt} = -(4224 + .026743v^2)$$

$$\frac{dv}{dt} = -(25.37470 + .00016065v^2)$$

20 ft./ sec.^{2} brake deceleration

$$166.465 \frac{dv}{dt} = -(3391 + .026743v^2)$$

$$\frac{dv}{dt} = -(20.37065 + .00016065v^2)$$

15 ft./sec.^{2} brake deceleration

$$166.465 \frac{dv}{dt} = -(2559 + .026743v^2)$$

$$\frac{dv}{dt} = -(15.37260 + .00016065v^2)$$

Engine in—

25 ft./sec.^{2} brake deceleration

$$174.272 \frac{dv}{dt} = -(4267 + 2.15v + .028293v^2)$$

$$\frac{dv}{dt} = -(24.48471 + .012337v + .00016235v^2)$$

20 ft./sec^2 brake deceleration

$$174.272 \frac{dv}{dt} = -3434 + 2.15v + .028393v^2)$$

$$\frac{dv}{dt} = -(19.70483 + .012337v + .00016235v^2)$$

15 ft./sec.^{2} brake deceleration

$$174.272 \frac{dv}{dt} = -(2602 + 2.15v + .028293v^2)$$

$$\frac{dv}{dt} -(14.93068 + .012337v + .00016235v^2)$$

The corresponding equations for S are:

Engine out

$$s_{25} = 7166.465 \log_{10} (1 + .0000063311v_0^2)$$
$$s_{20} = 7166.465 \log_{10} (1 + .0000078863v_0^2)$$
$$s_{15} = 7166.465 \log_{10} (1 + .0000104504v_0^2)$$

(Continued on Page 6)

NEW GLASS-EDGING MACHINE

Los Angeles, May 20.—With the shipping of a forty-five-ton glass-edging machine by the Weber Showcase and Fixture Company to the Ford Motor Company plant at Detroit, the first such machine in the automotive industry will soon be in use.

The machine, the first of its kind ever built, was manufactured here after being conceived, designed and built by Karl Weber, vice-president of the Weber Company.

Weighing forty-five tons, ninety feet long and five feet wide and rising seven feet above the floor, the machine grinds and polishes the four edges of automobile glass and automatically executes the finishing on either straight or curved edges or rounded corners. It has a production capacity of 3,000 finished pieces per day and does the work of fifty men.

The Weber company several years ago developed a straight-edge grinding and polishing machine (first noted in Automotive Daily News), but capable of only finishing one edge at a time, using it for its own purposes and selling several to automobile plants.

The Ford Motor Company, when designing its new V-8, commissioned the Weber company to make a machine for grinding and polishing all four edges of the panes as well as the curves and corners, in one continuous operation. The present machine is the result of eight months' work.

The grinding of safety glass, such as is used in the new Ford de luxe models as regular equipment, requires unusual care, and the Weber machine does this with the same expertness that it handles ordinary plate glass.

Seventy-two large grinding wheels, several two-ton wheel devices for turning the glass plates, a variety of chain gears and other equipment are so carefully adjusted that, driven by its built-in power units, it works with clock-like smoothness and precision. Six panes of glass can be fed into the machine at a time.

The turning devices are, in effect, giant hands. Each one is a large wheel with side castings of aluminium and center partitions of rubber molded on boiler plate.

The Need for Co-ordinated Transportation

This is the second installment of a paper by J. F. Winchester, Standard Oil Company of New Jersey, read before the New England Section, S. A. E.

"Our past experience with express and parcel-post service ought to have opened our eyes to the fact that our container was not suitable for parcel traffic. If they have not been opened by the trucks, we are indeed blind. The truck offers a container admirably suited in size for the transportation of parcels and built on modern, scientific principles of shock absorption. As a result, it dispenses with the need for those rigid packing requirements, and therefore saves the shipper not only time, but the expense of complying with these requirements which in some cases exceeds the freight charges. There is small wonder that the truck is playing hob with our merchandise traffic.

"Except in comparatively rare instances the methods of the railroads are conducive to delay rather than speed in transportation. Since there is rarely co-ordination between the drayman and the railroad, a failure upon the part of the former to reach the freight house before the closing hour may result in a twenty-four-hour delay. Few appreciate the time required for the movement of cars through our terminals. Of the total life of a freight car, approximately 90 per cent. is spent in terminals, switching, loading, unloading and around shops; only 10 per cent. spent in line-haul movement. No small part of the blame for this situation is due to the railroad's insistence that freight be brought to its right of way.

"The keystone of the success of the truck is that it can, and in many cases does, consistently give overnight service within a range of 350 miles.

"The freight rate structure of this country is basically a value-of-the-service structure. To use a more descriptive but opprobrious term, our rates are what the traffic will bear.

"Other parcel carriers, including express, postal and truck, have simplified their classification and their rate structure. The railroad l. c. l. classification comprises 700 pages of unintelligible jargon which no layman understands and about which no two experts can agree. It is a modern doomsday book. It discourages l. c. l. traffic by its lack of intelligence, its illogical ratings, as well as by its illiberal packing requirements. Under the value-of-the-service theory, wide variations in carload ratings are necessary. Since, however, l. c. l. traffic is but 10 per cent. of the traffic, the need to apply such a theory to it is not apparent, particularly in view of the fact that, although the variation between the highest and lowest l. c. l. rating is 700 per cent., that between the average rating (weighted by revenue) and the lowest rating is but 12½ per cent.

"A modern, co-ordinated transportation will recoup the freight traffic which has been lost, not only to the trucks, but to the express agency, parcel post and forwarders as well. The steps necessary to furnish that kind of railroad service seem radical only because of the stagnation of a century to overcome in both the operating and traffic departments of the railroad."

Having brought out the different points in connection with co-ordinated transportation, it is my idea that we can all contribute toward it, and particularly act as a protecting interest in the automotive industry by taking an active interest in such matters. There is a great deal of information that can be obtained on this particular subject from the National Automobile Chamber of Commerce, the Interstate Commerce Commission, etc., that make very interesting reading, and certainly if the automotive industries are to continue along the prosperous lines enjoyed in the past then we must do our part in promoting its interest.

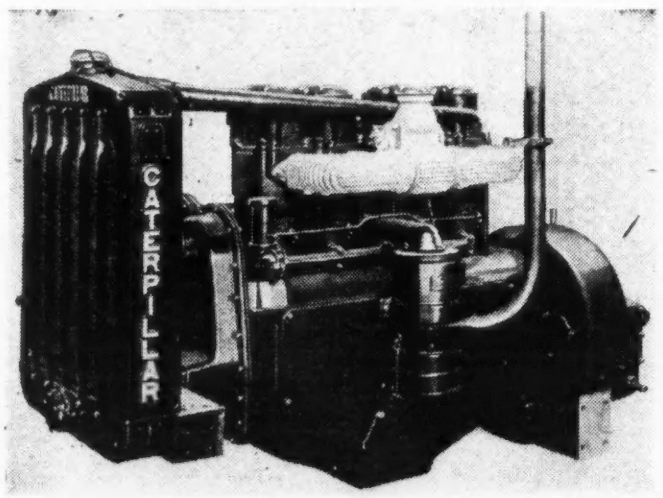
Do you realize that as a result of failure on the part of the citizens to take an active part in matters, we are considerably behind other countries in the matter of co-ordinated shipping and handling of materials.

It has been stated that "the delivery of freight by motors or drays directly to consignees upon its arrival at the receiving railroad stations and the use of the same motors or drays to bring outbound shipments to the depots of the railroads would eliminate the worst defects in the existing terminal transportation system, which are the congestion of platforms at the freight houses, caused by the holding of goods at the station until the consignees receive their arrival notices and make arrangements for the haulage of goods to their places of business, and the delay to the shippers' and consignees' vehicles at the station platforms and on streets about freight depots.

"The prevailing practice is to notify the consignee of the arrival of less-than-carload freight after it has been unloaded into the freight houses. Forty-eight hours' free time is allowed the consignee, after the sending or giving of the notices, to unload carload freight and to remove less-than-carload freight from the freight stations. Partly because of unorganized cartage methods and inadequate storage facilities, and partly because many goods are sold after arrival at the terminals, a large proportion of the consignees take advantage of the full free-time period, and some allow their goods to remain at the station beyond that period. Less-than-carload shipments are allowed to remain in the railroad freight houses an average of three days. A well-organized store-door delivery plan should make the freight house space available for use not less than twice a day, instead of one every three days.

(To be continued)

Caterpillar's Stationary Unit



The Caterpillar Tractor Company is now offering to the trade a line of its tractor motors that have been adapted for stationary and industrial power uses.

Heading this list of "Caterpillar" engines is the Diesel. This new Diesel is a 6⅛ x 9¼ inches, four-cylinder engine, turning at 700 r. p. m. This engine, it is claimed, burns thirty to forty per cent. less fuel per hour than an equivalent gasoline engine, and burns a grade of fuel that normally sells at a price one-third to one-half the price of standard gasoline.

The next engine in the "Caterpillar" line is the sixty-five. This is a four-cylinder, 7 x 8½-inch motor turning at 650 revolutions per minute.

The "Caterpillar" fifty, thirty-five and twenty-five engines very closely resemble each other in design, construction and relative performance. The size and speeds of these engines are as follows:

Engine	No. of Cylinders	Bore	Stroke	r.p.m.
50	4	5½	6½	950
35	4	4¾	6½	950
25	4	4	5½	1,250

JOBBER OPENS BRANCH

New London, Conn., May 20.—Grinold Auto Parts, Inc., of Hartford has opened a branch store and shop at 578 Bank St., here.

New Dealers Appointed

MISSOURI

Studebaker—Floyd Capito & Co., Estill; Crouch Motor Company, Deepwater.

NEBRASKA

Studebaker—Western Auto Company, Weston.

NEW JERSEY

Graham-Paige—Bennett's Garage, Spotswood.

Studebaker — James Ale, Deepwater.

NEW YORK

Graham-Paige—Ronald Reynolds, Troy; Enright Motor Sales Company, Goshen.

Auburn — Auburn Uttal Sales, Brooklyn.

Studebaker — Public Service Garage, Hancock; Chester Garage, Chester; Coney Island Motors, Inc., Brooklyn.

OHIO

Graham-Paige—Fallor & Hadlock, Medina; Merrick, Inc., Painesville.

Studebaker — The Franklin Youngstown Company, Youngstown; Perry-Grace Auto Company, Cuyahoga Falls; the Charles Schiear Motor Car Company, Cincinnati.

OKLAHOMA

Studebaker—Moorhead's Garage, Ardmore; Salters Service Station, Sulphur; T. D. Stough, Okmulgee.

PENNSYLVANIA

Graham-Paige — C. A. Johnson Motor Sales, Brockway; Roller-Hart Company, Williamsport.

Studebaker—Oscar T. Hahn, Berwick; Foss-Hughes Company, Philadelphia; Keck Brothers Garage, Northampton; Liberty Garage, Middletown; H. M. Muth, Perkasie.

TEXAS

Graham-Paige—Wood Motor Company, Inc., Marshall; Johns Brothers Motor Company, Inc., Austin.

Auburn—Johns Brothers Motor Company, Inc., Austin.

UTAH

Studebaker—Harold Bullock, Coalville; C. & P. Service, Duchesne.

VIRGINIA

Graham-Paige—Tysinger Motor Company, Hampton.

WEST VIRGINIA

Studebaker—Leonard Motors, Fairmont.

WISCONSIN

Studebaker—Ed Thom, Reedsburg.

WYOMING

Auburn — Overland Garage, Lander.

Studebaker—Bridger Valley Motor Company, Ft. Bridger.

TEN ENGINEERS OF MUNCIE PRODUCTS AT OLDS WORKS

Lansing, Mich., May 20.—Ten engineers from the Muncie Products Company, Muncie, Ind., General Motors subsidiary, whose engineering department was moved to the Olds Motor Works and Administration Building in this city, have arrived and begun functioning as a division. Transfer of the engineers here is intended to aid in research co-ordination between General Motors units.

MAJOR SPECIFICATIONS AND MECHANICAL DETAILS

Make and Model	Weight—5-P. Sedan	Wheel Base	Engine Make	Thermostat Used	Valve Arrangement	Cylinders	Bore and Stroke	Piston Displ.	Compression Ratio	Tax H. P.	Brake, H.P. and Peak R. P. M.	Pist. Make or Material	No. Main Br.	Oil Purifier	Fuel Cleaner	Carburetor	Air Cleaner
Auburn 8-100	——	127-136	Lyc	Dole	L	8	3 x4¾	268.6	2.56	28.8	118@3400	*Alum	5	Pur	No	Str	No
Auburn 12-160	——	133	Lyc	Dole	O	12	3⅛x4¼	391.0	5.50	46.8	160@3400	*Alum	4	Pur	Ste	Str	—
Austin	§1150	75	Own	No	L	4	2.2x3	45.6	5.10	7.8	13@3000	Alum	2	No	No	Til	No
Buick 32-50	3450	114	Own	Bish-Bab	O	8	2⅞x4¼	230.4	4.65	27.61	78@3200	CI	5	AC	AC	Mar	AC
Buick 32-60	3980	118	Own	Bish-Bab	O	8	3⅛x4⅝	272.6	4.63	30.02	90@3000	CI	5	AC	AC	Mar	AC
Buick 32-80	4450	126	Own	Bish-Bab	O	8	3⅜x5	344.8	4.40	35.12	104@2900	CI	5	AC	AC	Mar	AC
Buick 32-90	4565	134	Own	Bish-Bab	O	8	3⅜x5	344.8	4.40	35.12	104@2900	CI	5	AC	AC	Mar	AC
Cadillac 355 B	4885	134-140	Own	Har	L	8	3⅜x4½	353.0	5.38	36.4	115@3000	CI	3	AC	AC	Own	AC
Cadillac 370 B	5175	134-140	Own	Har	O	12	3⅛x4	368.0	5.30	46.9	135@3400	CI	4	Cuno	AC	DL	AC
Cadillac 452 B	5625	143-149	Own	Har	O	16	3 x4	452.0	5.36	57.5	165@3400	CI	5	Cuno	AC	DL	AC
Chevrolet	——	109	Own	No	O	6	3⅛x3¾	194	5.20	26.3	60@3000	CI	3	—	—	Car	AC
Chrysler 6	3120	116	§Own	Yes	L	6	3¼x4½	223.9	5.35	25.35	82@3400	*Alum	4	Pur	Yes	B & B	Yes
Chrysler 8	3860	125	§Own	Yes	L	8	3¼x4½	298.6	5.20	33.80	100@3400	*Alum	5	Pur	Yes	Str	Yes
Chrysler Imp. 8	——	135	§Own	Yes	L	8	3½x5	384.8	5.20	39.20	125@3200	*Alum	9	Pur	Yes	Str	Yes
Chrysler Imp. 8 cus.	——	146	§Own	Yes	L	8	3½x5	384.8	5.20	39.20	125@3200	*Alum	9	Pur	Yes	Str	Yes
Cord (Fr. Wh. D.)	4620	137½	Lyc	Dole	L	8	3¼x4½	298.6	5.25	33.8	115@3300	*Alum	5	Pur	AC	Sch	No
De Soto Six	3008	113	§Own	Yes	L	6	3¼x4¼	211.5	5.35	25.35	75@3400	*Alum	4	Pur	Yes	B & B	Yes
De Vaux 6-80	2810	114	Con	Dole	L	6	3⅜x4	214.7	5.20	27.34	75@3600	Alum	4	—	Yes	Til	AC
Dodge Six D L	3084	114¼	§Own	Yes	L	6	3¼x4⅜	217.7	5.35	25.35	79@3400	Alum	4	Pur	Yes	Car	Yes
Dodge Eight D K	3488	122	§Own	Yes	L	8	3¼x4¼	282.1	5.20	33.80	90@3400	Alum	5	Pur	Yes	Str	Yes
Essex-Gr. Su. 6	——	113	†Own	——	L	6	2⅞x4¾	193.0	5.50	20.7	70@3200	Alum	3	No	Ste	Mar	AC
Ford A	2357	106	Own	No	L	4	3⅛x4¼	200.5	4.60	24.03	50@2600	Alum	3	—	—	Zen	—
Ford V8	†2447	106	Own	No	L	8	3⅛x3¾	220.0	5.50	30.0	65@3400	Alum	3	—	—	DL	—
Franklin Airman	——	132	*Own	Ful	O	6	3½x4¾	——	5.10	——	100@3100	*Alum	7	Pur	Yes	Str	Yes
Franklin V-12	——	144	*Own	Ful	O	12	3¼x4	398.0	5.12	——	150@3100	*Alum	7	Pur	Yes	Str	Yes
Graham 6	3205	113	Own	Yes	L	6	3½x4½	207	5.45	23.4	70@3200	*Alum	7	No	AC	Sch	AC
Graham 8	3665	123	Own	Bish-Bab	L	8	3⅛x4	245.4	6.50	31.25	90@3400	*Alum	5	AC	AC	DL	AC
Hudson Greater 8	——	119-126-132	†Own	——	L	8	3 x4½	254.1	5.80	28.8	101@3600	Alum	5	No	Ste	Mar	AC
Hupmobile 216	3115	116	Own	Bish-Bab	L	6	3⅜x4¼	228.1	5.00	27.34	75@3200	*Alum	4	**	Ste	Str	AC
Hupmobile 222	3580	122	Own	Bish-Bab	L	8	2⅞x4⅝	250.7	5.40	27.61	93@3200	Alum	5	Pur	Ste	Str	AC
Hupmobile 226	3755	126	Own	Bish-Bab	L	8	3⅛x4¾	279.9	5.47	30.10	103@3200	Alum	5	Pur	Ste	Str	AC
La Salle 345 B	4840	130-136	Own	Har	L	8	3⅜x4½	353.0	5.38	36.4	115@3000	CI	3	AC	AC	Own	AC
Lincoln V-8	5430	136	Own	Yes	L	8	3½x5	384.0	5.23	39.2	125@2900	Alum	5	No	AC	Str	AC
Lincoln V-12	5750	145	Own	Yes	L	12	3¼x4½	448.0	5.25	50.7	150@3400	Alum	7	No	AC	Str	AC
Marmon 8	3500	125	Own	Yes	L	8	3¼x4¾	315.2	5.50	33.8	135@3400	Alum	5	Flo	AC	Str	AC
Marmon 16	5360	145	Own	Pines	O	16	3⅛x4	490.8	5.75	62.5	200@3400	Alum	5	†	AC	Str	AC
Nash Big Six	3200	116	Own	Bish-Bab	L	6	3⅛x4⅜	201.3	5.10	23.4	70@3000	*Alum	7	Pur	AC	Str	AC
Nash Stand. Eight	3400	121	Own	Bish-Bab	L	8	3 x4⅜	247.4	5.10	28.8	85@3200	*Alum	9	Pur	AC	Str	AC
Nash Spec. Eight	3870	128	Own	Bish-Bab	O	8	3⅛x4¼	260.8	5.25	31.2	100@3400	*Alum	9	Pur	AC	Str	AC
Nash Adv. Eight	4350	133	Own	Bish-Bab	O	8	3⅜x4½	322.0	5.25	36.4	125@3600	*Alum	9	Pur	AC	Str	AC
Nash Ambas. Eight	4510	142	Own	Bish-Bab	O	8	3⅜x4½	322.0	5.25	36.4	125@3600	*Alum	9	Pur	AC	Str	AC
Oldsmobile F-32	3035	116½	Own	No	L	6	3⅛x4⅛	213.3	5.80	26.3	74@3200	CI	4	AC	AC	Str	AC
Oldsmobile L-32	3165	116½	Own	No	L	8	3 x4¼	240.3	5.90	28.8	87@3350	CI	5	AC	AC	Str	AC
Packard Twin Six	5225	142-147	Own	Yes	L	12	3⅛x4	445.5	6.00	56.0	160@3200	*Alum	4	Yes	Yes	Own	AC
Packard Stan. 8	4570	130-137	Own	Yes	L	8	3⅛x5	320.0	6.00	32.5	110@3200	*Alum	9	Yes	Yes	Own	AC
Packard De L. 8	5045	142-147	Own	Yes	L	8	3½x5	384.8	6.00	39.2	135@3200	*Alum	9	Yes	Yes	Own	AC
Packard Light 8	4115	127¾	Own	Yes	L	8	3⅛x5	320.0	6.00	32.50	110@3200	*Alum	9	Yes	Yes	Own	AC
Peerless De L. Mas.	4521	125	Con	Bish-Bab	L	8	3⅜x4⅛	322	5.00	36.45	115@3200	*Alum	5	Pur	AC	Sch	AC
Peerless De L. Cus.	4766	138	Con	Bish-Bab	L	8	3⅜x4½	322	5.00	36.45	120@3200	*Alum	5	Pur	AC	Sch	AC
Pierce-Arrow 54	4819	137-142	Own	Pines	L	8	3½x4¾	366	5.05	39.2	125@3000	*Alum	9	Pur	Ste	Str	AC
Pierce-Arrow 52	5080	142-147	Own	Pines	L	12	3⅜x4	429	5.05	54.6	150@3200	*Alum	7	Pur	Ste	Str	AC
Pierce-Arrow 53	5395	137-142	Own	Pines	L	12	3¼x4	398	5.05	50.7	140@3200	*Alum	7	Pur	Ste	Str	AC
Plymouth	2875	112	§Own	No	L	4	3⅜x4¾	196.1	4.90	21.03	65@3000	Alum	3	Yes	AC	Car	Yes
Pontiac 6	2870	114	Own	Yes	L	6	3⅛x3⅞	200.0	5.10	26.3	65@3200	CI	3	No	AC	Mar	Yes
Pontiac V-8	3225	117	Own	Yes	H	8	3⅛x3⅜	251.0	5.20	37.8	85@3200	CI	3	No	AC	Mar	Yes
Reo Fly. Cloud "S"	3405	117	Own	Yes	L	6	3⅛x5	230.0	5.30	23.4	80@3200	Lo-Ex	7	Yes	Yes	Zen	Yes
Reo Royale Cust.	4650	135	Own	Pines	L	8	3⅜x5	358	5.30	36.48	125@3300	Alum	9	Han	AC	Sch	Own
Reo Royale	4375	131	Own	Pines	L	8	3⅜x5	358	5.30	36.48	125@3300	Alum	9	Han	AC	Sch	Own
Reo 8-25	4050	125	Own	Yes	L	8	3 x4¾	268.6	5.37	28.8	90@3300	*Alum	5	Han	V S	Sch	Un
Rockne 6-65	2595	110	Own	Dole	L	6	3⅛x4⅛	189.8	5.00	23.4	66@3200	CI	4	No	AC	Str	No
Rockne 6-75	3000	114	Own	Dole	L	6	3¼x4⅛	205.3	5.00	25.4	72@3200	CI	4	Own	AC	Str	No
Studebaker 6-55	3170	117	Own	Dole	L	6	3¼x4⅝	230.0	5.00	25.4	80@3200	CI	4	No	Ste	Str	No
Studebaker Dict. 62	3240	117	Own	Bish-Bab	L	8	3⅛x3¾	221.0	5.00	30.0	85@3200	CI	9	Pur	Ste	Str	AC
Studebaker Com. 71	3545	125	Own	Bish-Bab	L	8	3⅛x4¼	250.4	5.20	30.0	101@3200	*Alum	9	Pur	Ste	Str	AC
Studebaker Pres. 91	4260	135	Own	Dole	L	8	3½x4⅜	337.0	5.10	39.2	122@3200	*Alum	9	Han	Ste	Str	AM
Stutz LAA	4383	127½	Own	No	O	6	3⅜x4½	241.5	5.50	27.3	85@3150	*Alum	7	Pur	AC	Zen	Un
Stutz SV-16	4885	134½-145	Own	No	O	8	3⅜x4½	322	5.50	36.4	113@3300	*Alum	9	Pur	AC	Zen	AM
Stutz DV 32	5281	134½-145	Own	Bish-Bab	O	8	3⅜x4½	322	5.10	36.4	156@3900	*Alum	9	Pur	Ste	Str	AC
Willys-Ov'land 6-90	2814	113	Own	Yes	L	6	3¼x3⅞	193.0	5.26	25.35	65@3400	CI	4	No	AC	Til	Til
Willys-Ov'land 8-88	3250	121	Own	Yes	L	8	3⅛x4	245.4	5.26	31.25	80@3200	CI	5	No	AC	Til	AC
Willys-Kni. 66-D	3775	121	Own	Yes	K	6	3⅜x4¾	255.0	5.50	27.34	87@3200	*Alum	7	Pur	Til	Til	AC
Willys-Knight 95	3031	113	Own	Yes	K	6	2⅞x4⅜	177.9	5.55	20.70	60@3400	*Alum	7	Pur	AC	Til	AC

G. M. Tests Prove Safety Of Free Wheeling Cars

(Continued from Page 5)

Engine in

$$s_{25} = 7091.42312 \log_{10}(1 + .00050387v_o + .0000066307v_o^2) - 599.37813 \tan^{-1}\frac{.12678v_o}{48.96942 + .012337v_o}$$

$$s_{20} = 7091.42312 \log_{10}(1 + .00062609v_o + .0000082391v_o^2) - 681.28227 \tan^{-1}\frac{.11154v_o}{39.40966 + .012337v_o}$$

$$s_{15} = 7091.42312 \log_{10}(1 + .00082629v_o + .0000108736v_o^2) - 771.72329 \tan^{-1}\frac{.098468v_o}{29.86136 + .012337v_o}$$

v_o = Feet per second, initial velocity.

These equations were solved for a range of values of V_o from 20 to 100 mi./hr. by steps of 10 mi./hr. This range is, of course, far beyond the maximum speed of the car taken, and also beyond the speed at which it would be safe to apply the brakes so heavily, but it was desired to get the trend of the stopping distances for a wide speed range.

The results are given in the following tables:

STOPPING DISTANCE—FEET

25 Feet Per Second² Brake Deceleration

V_o Mi/Hr.	Engine Out	Engine In	Ft. Engine In Ft. Engine Out
20	16.9086	17.3488	+ .4402
30	37.9183	38.7243	+ .8080
40	67.0917	68.1906	+1.0989
50	104.2018	105.4113	+1.2095
60	148.9700	149.9965	+1.0265
70	201.0602	201.5223	+ .4621
80	260.0968	259.5600	— .5368
90	325.6829	323.6236	—2.0593
100	397.3862	393.2616	—4.1246

20 Feet Per Second² Brake Deceleration

V_o Mi/Hr.	Engine Out	Engine In	Ft. Engine In Ft. Engine Out
20	21.0479	21.4917	+ .4438
30	47.1604	47.8615	+ .7011
40	83.3517	84.0948	+ .7431
50	129.2737	129.6514	+ .3777
60	184.4978	183.9894	— .5084
70	248.5251	246.4770	—2.0481
80	320.7961	316.4753	—4.3208
90	400.7301	393.3561	—7.3740
100	487.7045	476.4401	—11.2644

15 Feet Per Second² Brake Deceleration

V_o Mi/Hr.	Engine Out	Engine In	Ft. Engine In Ft. Engine Out
20	27.8611	28.2321	+ .3710
30	62.3404	62.9179	+ .5775
40	109.9802	109.7613	— .2189
50	170.1749	168.5624	— 1.6125
60	242.2029	238.2195	— 3.9834
70	325.2335	317.7385	— 7.4950
80	418.3574	406.1409	—12.2165
90	520.6415	503.1592	—17.4823
100	631.1183	605.6747	—25.4436

The differences of the stopping distances for each value of V_o and for the different decelerations are plotted on the attached curve sheets. On the curve sheet + values represent less stopping distance with the engine out.

Effect of closed throttle in increasing engine resistance and power developed by the small amount of fuel admitted with closed throttle has been neglected in above discussion. The effect of these would probably be to slightly decrease engine resistance and hence be somewhat in favor of leaving the engine out.

Conclusions:

1.—The greater the braking force the greater the speed below which it is advantageous to leave the engine out if minimum stopping distance is desired.

2.—The advantage gained by leaving the engine out is very small, so small that it could hardly be found by ordinary testing methods.

3.—Practically, for large braking forces and ordinary speed ranges, it makes little difference in stopping distance whether engine is left in or out.

4.—Obviously for small braking forces minimum stopping distance will be obtained by leaving the engine in.

REHBERGER APPOINTED

Newark, N. J., May 20.—Arthur Rehberger & Sons, Inc., 316-320 Ferry St., has been appointed distributor for Studebaker trucks. The Rehberger concern manufactures Rehberger motor vehicles and motor coach chassis.

OF PRESENT AMERICAN PASSENGER CAR MODELS

Make and Model	Front End Drive	Ignition System	Gen. and Starter	Clutch	Transmission Make	Transmission Speeds	Transmission Type	Universals	Rear Axle	Ratio	Brakes	Steering Gear	Springs Rear	Spring Shackles	Chassis Lubric.	Tires
Auburn 8-100	Chain	Del-R	*Del-R-S	Long	D	3	SM-LGS-F	U	Col	*4.70	M	Ross	S 56¾	Own	Bijur	17x6.00
Auburn 12-160	Link	Del-R	*Del-R-S	Long	D	3	SM-LGS-F	M	Col ½	*4.55	Bendix	Ross	S 56¾	Own	Bijur	*17x6.00
Austin	Gear	Aut-L	*Aut-L	Rock	WG	3	—	S	Sal ½	5.25	M	Say-B	Cant	Own	Al-Z	18x3.75
Buick 32-50	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ½	4.60	Own	Sag	S 56	Tryon	Al-Z	18x5 50
Buick 32-60	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ¾	4.54	Own	Sag	S 55¼	Own	Al-Z	18x6.00
Buick 32-80	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ¾	4.27	Own	Sag	S 58⅞	Own	Al-Z	18x7.00
Buick 32-90	Tex	Del-R	Del-R	*Own	O	3	SM-BW-F	O	Own ¾	4.27	Own	Sag	S 58⅞	Own	Al-Z	18x7.00
Cadillac 355 B	Morse	Del-R	Del-R	Own	O	3	SM	S	Own ¾	4.60	Own M	Sag	S 58	Own	Alem	17x7 00
Cadillac 370 B	Morse	Del-R	Del-R	Own	O	3	SM	S	Ov n ¾	4.80	Own M	Sag	S 58	Own	Alem	17x7.50
Cadillac 452 B	Morse	Del-R	Del-R	Own	O	3	SM	S	Own ¾	4.64	Own M	Sag	S 60	Own	Alem	18x7.50
Chevrolet	—	Del-R	*Del-R	Own	O	3	SM-F	—	Own ½	—	—	Sag	S 54	—	Alem	18x5.25
Chrysler 6	Chain	Del-R	Del-R	*—	O	3	— F	—	Own ½	4.60	H	Own	S 53⅜	—	Alem	18x5.50
Chrysler 8	Chain	Del-R	Del-R	*—	O	4	— F	—	Own ½	4.30	H	Gem	S 54⅝	—	Alem	17x6.50
Chrysler Imp. 8	Chain	Del-R	Del-R	*—	O	4	— F	—	Own ½	4.10	H	Gem	S 57½	—	Al-Z	17x7.00
Chrysler Imp. 8 Cus.	Chain	Del-R	Del-R	*—	O	4	— F	—	Own ½	4.10	H	Gem	S 57½	—	Al-Z	17x7.50
Cord (Fr. Wh. Dr.)	Link	Del-R	*Del-R	Long	D	3	—	*	Col F	4.80	H	Gem	S 62	Own	Bijur	18x7.00
De Soto Six	Chain	Del-R	Del-R	*Own	O	3	— F	S	Own ½	4.62	H	Own	S 53⅜	—	Alem	18x5.25
De Vaux 6-80	Morse	Aut-L	*Aut-L	Borg	W	3	—	S	‡AD ½	4.40	M	†W	S 54¼	Tryon	Al-Z	19x5.25
Dodge Six D L	Chain	Del-R	—	—	O	3	— F	—	Own ½	4.60	H	Own	S 54⅞	—	Al-Z	18x5 50
Dodge Eight D K	Chain	Del-R	Del-R	*—	O	3	— F	—	Own ½	4.10	H	Gem	S 55	—	Al-Z	18x6.00
Essex Gr. Su. 6	Morse	Aut-L	*Aut-L-S	Own	O	3	SM-WG-F	S	Own ½	4.63	Bendix	Gem	S 54⅛	Own	Alem	18x5.25
Ford A	Var-G	Own	*Own	Own	O	3	SM	O	Own ¾	4.11	M	Gem	S-Tr 39	Own	Al-Z	18x5.25
Ford V8	Var-G	Own	*Own	Own	O	3	SM	O	Own ¾	4.11	M	Gem	S-Tr	Own	Al-Z	18x5.25
Franklin Airman	Chain	Del-R	*Del-R-S	—	W	3	SM-BW-F	M	— ½	4.73	H	Gem	El 42	—	Al-Z	19x6.50
Franklin V-12	Chain	Del-R	*Del-R-S	Long	W	3	SM-BW-F	M	Col ½	4.45	H	Ross	S 60	Fafnir	Al-Z	17x7.50
Graham 6	Link	Del-R	Del-R	Long	WG	3	WG-F	U	Sal ½	4.45	H	Ross	S 54	ERS	Al-Z	17x5 50
Graham 8	Link	Del-R	Del-R	Long	WG	3	SM-WG-F	S	Sal ½	4.30	H	Ross	S 54	ERS	Al-Z	17x6 00
Hudson Greater 8	Morse	Aut-L	*Aut-L-S	Own	O	3	SM-WG-F	S	Own ½	†4.63	Bendix	Gem	S 54⅛	Own	Alem	*17x6.00
Hupmobile 216	Chain	Aut-L	*A-L-S-§	Borg	WG	3	SM-WG-F	M	Spic ½	4.54	M	Ross	S 53	Tryon	Al-Z	18x5 50
Hupmobile 222	Morse	Aut-L	*A-L-S-§	Borg	WG	3	SM-WG-F	U	Own ½	4.36	M	Gem	S 57½	Rub-B	Al-Z	17x6.00
Hupmobile 226	More	Aut-L	*A-L-S-§	Long	D	3	SM-DG-F	U	Own ½	4.36	M	Gem	S 57½	Rub-B	Al-Z	17x6.50
La Salle 345 B	Morse	Del-R	Del-R	Own	O	3	SM	S	Own ¾	4.60	Own M	Sag	S 58	Own	Alem	17x7.00
Lincoln V-8	Chain	Aut-L	*Aut-L	Long	O	3	SM-F	S	Own F	4.58	*Bendix	Own	S 62	Own	Alem	18x7.00
Lincoln V-12	Chain	Aut-L	*Aut-L	Long	O	3	SM-F	S	Own F	4.58	*Bendix	Own	S 62	Own	Alem	18x7.50
Marmon 8	Diam	Del-R	*Del-R	*—	D	3	SM	S	Spic ½	4.08	Bendix-	Ross	S 57	Tryon	Alem	18x6.00
Marmon 16	Diam	Del-R	Del-R	Rus	M	3	SM	S	Spic ½	3.78	Bendix	Ross	S 59½	**	Alem	18x7.00
Nash Big Six	Chain	Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.70	M	Ross	S 54	ERS	Alem	18x5.25
Nash Stand. Eight	Chain	Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.44	M	Ross	S 54	ERS	Alem	18x5.50
Nash Spec. Eight	Chain	*Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.43	Bendix	Gem	S 55¾	*	Bijur	17x6 50
Nash Adv. Eight	Chain	*Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.50	Bendix	Gem	S 57½	*	Bijur	18x7.00
Nash Ambas. Eight	Chain	*Aut-L	*A-L-S-§	Borg	O	3	SM-DG-F	O	Own ½	4.50	Bendix	Gem	S 57½	*	Bijur	18x7.00
Oldsmobile F-32	Chain	Del-R	Del-R	Borg	M	3	SM-BW-F	S	Own ½	4.56	Bendix	Sag	S 54½	Tryon	Al-Z	17x6 00
Oldsmobile L-32	Chain	Del-R	Del-R	Borg	M	3	SM-BW-F	S	Own ½	4.77	Bendix	Sag	S 54½	Tryon	Al-Z	17x6.00
Packard Twin Six	Morse	Aut-L	*Dyn	*Long	O	3	SM	M	Own ½	4.69	M	Own	S 60½	Own	Bijur	18x7.50
Packard Stan. 8	Morse	N E	*Dyn	Long	O	3	SM	M	Own ½	4.66	M	Own	S 60½	Own	Bijur	6.50x19
Packard De L. 8	Morse	N E	*Dyn	Long	O	3	SM	M	Own ½	4.66	M	Own	S 60½	Owr	Bijur	7.00x19
Packard Light 8	Morse	N E	*Dyn	*Long	O	3	SM	S	Own ½	4.66	M	Own	S 56	Own	Alem	17x6.50
Peerless De L. Mas.	Morse	Aut-L	*Aut-L	Rock	WG	3	WG-F	S	Sal ½	4.45	Bendix	Ross	S 60	Rub B	Alem	31x6.00
Peerless De L. Cus.	Morse	Aut-L	*Aut-L	Rock	WG	3	WG-F	S	Sal ½	4.80	Bendix	Ross	S 60	Rub B	Alem	31x6.50
Pierce-Arrow 54	Chain	Del-R	*Del-R-S	Long	O	3	SM-F	S	Own ½	4.42	Bendix	Ross	S 61	Faf	Myers	18x6.50
Pierce-Arrow 52	Chain	Del-R	*Del-R-S	Long	O	3	SM-F	S	Own ½	4.42	Bendix	Ross	S 61	Faf	Myers	18x7.00
Pierce-Arrow 53	Chain	Del-R	*Del-R-S	Long	O	3	SM-F	S	Own ½	4.58	Bendix	Ross	S 61	Faf	Myers	18x7 00
Plymouth	Var	Del-R	Del-R	*Own	O	3	BW-F	O	Own ½	4.33	H	War	S 53⅜	—	Al-Z	18x5.25
Pontiac 6	Chain	Del-R	Del-R	Own	M	3	SM-BW-F	M	Own ½	4.55	Bendix	Sag	S 54	Inlox	Al-Z	18x5 25
Pontiac V-8	Link	Del-R	Del-R	Own	M	3	SM-BW-F	M	Own ½	4.22	Bendix	Sag	S 54½	Inlox	Al-Z	17x6.00
Reo Fly. Cloud "S"	Chain	Del-R	*Del-R-S	Long	O	3	SM-F	S	Own ½	4.60	H	Ross	S 55	Tryon	AL-Z	17x5.50
Reo Royale Cust.	Morse	Del-R	Del-R-§	Long	O	3	SHG	U	Own ½	4.07	H	Ross	S 57½	Own	Far	6.50x18
Reo Royale	Morse	Del-R	Del-R-§	Long	O	3	SHG	U	Own ½	4.07	H	Ross	S 57½	Own	Al-Z	6.50x18
Reo 8-25	Link	Del-R	*Del-R	Long	O	3	SHG	U	Own ½	4.90	H	Ross	S 55¾	Own	Al-Z	17x6.50
Rockne 6-65	Morse	Aut-L	*Aut-L-S	Borg	WG	3	SM-BW-F	M	Spic ½	4.55	Bendix	Ross	S 54	Tryon	Al-Z	18x5.25
Rockne 6-75	Chain	Aut-L	*Aut-L-S	Long	WG	3	SM-BW-F	M	Own ½	4.73	Bendix	Ross	S 54	Tryon	Al-Z	18x5.50
Studebaker 6-55	Chain	Del-R	*Del-R-S	Long	O	3	SM-BW-F	S	Own ½	4.27	Bendix	Ross	S 54	Tryon	Alem	18x5.50
Studebaker Dict. 62	Cel	Del-R	*Del-R-S	Long	O	3	SM-BW-F	S	Own ½	4.73	Bendix	Ross	S 54	Tryon	Alem	18x5.50
Studebaker Com. 71	Cel	Del-R	*Del-R-S	Long	O	3	SM-BW-F	S	Own ½	4.73	Bendix	Ross	S 56	Faf	Alem	18x6.00
Studebaker Pres. 91	Var-G	Del-R	*Del-R-S	Borg	O	3	SM-BW-F	S	Own ½	4.31	Bendix	Ross	S 60	Faf	Alem	18x6.50
Stutz LAA	Link	Del-R	Del-R	Borg	D	4	—	U	Sal ½	5.10	H	Gem	S 60	Own	Bijur	19x6.50
Stutz SV-16	Link	Del-R	Del-R	Long	M	3	SM	M	Tim ½	4.75	H	Gem	S 62¾	Own	Bijur	18x7.00
Stutz DV-32	Link	Del-R	Del-R	Long	M	3	SM	M	Tim ½	4.50	H	Gem	S 62¾	Own	Bijur	18x7.00
Willys-Ov'land 6-90	Link	Aut-L	*Aut-L	Own	O	3	O-F	S	Own ½	4.60	Bendix	Own	S 51	Tryon	Alem	18x5.25
Willys-Ov'land 8-88	Link	Aut-L	*Aut-L	Borg	O	3	O-F	S	Own ½	4.40	Bendix	Ross	S 56	Tryon	Alem	18x5.50
Willys-Kni. 66-D	Link	Aut-L	*Aut-L	Rock	O	3	O-F	S	Own ½	4.18	Bendix	Ross	S 56	Tryon	Alem	17x6.00
Willys-Knight 95	Link	Aut-L	*Aut-L	Own	O	3	O-F	S	Own ½	4.89	Bendix	Gem	S 51	Tryon	Alem	18x5.50

KEY TO ABBREVATIONS

Weight — §Austin standard 2 passenger coupe. Stutz DV 145-inch wheel base weighs 5,352. †Tudor sedan.

Engine Make—Con. Continental; Lye. Lycoming. *Air-cooled with spot temperature control. †Thermo syphon water circulation. §Floating power.

Thermostat—Bish-Bab. Bishop & Babcock. Dole, Dole Valve Co., Chicago, Ill.; Ful, Fulton Co.; Har, Harrison; Pines, Pines Winterfront Var, various makes.

Valve Arrangement—L, L head; H, horizontal. O, overhead; K, sleeve valve; LV, V-type L head.

Piston Material—*Alum, aluminum with invar struts. Alum, aluminum alloy; CI, cast iron; S, St, semi-steel; Lo-Ex, Aluminum Corporation of America.

Oil Purifier—Wal, Wall; Han, Handy; AC, AC Spark Plug Company; Ste, Stewart-Warner; Ski, Skinner; Flo, Floato; Cuno, Cuno Engineering Corp; Pur, Purolator *Using both Floato and Skinner. †Using AC with Floato attachement. **Using both AC and Purolator.

Fuel Cleaner—AC, AC Spark Plug Co.; Gas, Gascolator; Ste, Stewart-Warner; Til, Tillotson; V-S, Van Sicklen

Carburetor—Sch, Wheeler Schebler; Zen, Zenith; Mar, Marvel; Car, Carter; Str, Stromberg; DL, Detroit Lubricator; Til, Tillotson; B&B, Borg & Beck.

Air Cleaner—AC, AC Spark Plug Company; AM, Air Maze; Un, United; Til, Tillotson.

Front End Drive—Link, Link Belt; Tex, Texolite; Cel, Celeron; Diam, Diamond Chain; Morse, Morse Chain Company; Var, various makes of chains; Var-G various makes of gears.

Ignition, Generator and Starter—Aut-L, Auto-Lite; A-L, Auto-Lite; Del-R, Delco-Remy; Dyn, Owen-Dyneto Corp.; N E, North East.
*Nash.—Indicates twin ignition.
*Bendix starter used. S—Startix equipped. §Startix optional equipment.

Clutch—Borg, Borg & Beck; Br-L, Brown-Lipe; Rock, Rockford Machine; Long, Long Clutch Company; Rus, Russell Mfg. Co. *Bendix Clutch Control.

Transmission Make—D, Detroit Gear; WG, Warner Gear Company; M, Muncie Gear Company; O, Own; N, New Process Gear Corp.; W, Warner Corp.
*Franklin Transcontinent models are equipped with both Warner and Detroit 3 or 4 speed gear sets, according to body type.

Transmission Type—DG, Detroit Gear & Machine Co.; LGS, The LGS Corp.; F, Free Wheeling; SM, Synchro Mesh; BW, Borg-Warner; NP—New Process Gear Corp.; WG, Warner Gear Co.; SHG, Synchronized Herringbone Gear.

Universals—U, Detroit Universal Products; S, Spicer Mfg. Corp.; O, Own, M, Mechanics Universal Joint Company.
*Cord using Detroit Universal Products and Mechanical Universal Joint Co.

Rear Axle—Col, Columbia; Sal, Salisbury. Spic, Spicer Mfg. Corp.; Tim, Timken; N.P., New Process Gear Corp.; ½, Semi-floating; ¾, ¾ floating; F, Full floating; ‡Adams used on custom models.

Ratio—*Dual ratio optional; Hudson 132-in. wheel base models have rear axle ratio of 5.10.

Brakes—H, hydraulic; M, mechanical; Bendix, Bendix Brake Corp. *Equipped with Vacuum Booster.

Steering Gear—Gem, Gemmer; Ross, Ross Gear and Tool Company; Sag, Saginaw. Ssy-B Saylor-Beall Manufacturing Company; War, Warner; N.P., New Process Gear Corp. †Ross used on custom models.

Rear Springs — S, semi-elliptic; El, full elliptic; Cant, semi-cantilever; S-Tr semi-transverse.

Spring Shackles—Tryon, Willys-Morrow Company; Rub B, Rubber Shock Insulator Company; Faf, Fafnir Bearing Company; ERS, Eaton Products, Inc.; Inlox—Inland Mfg. Co.; *Tryon, front. ERS, rear. *Own, front. ERS, rear. **Using both Rubber-B and Fafnir.

Chassis Lubricator—Alem, Alemite; Al-Z, Alemite Zerk; Bijur, Bijur Lubricating Corp.; Far, Farval. Myers—Chassis Lubricating Co.

Tires—Auburn 12 custom models equipped with 17x6.50. *Hudson 132-in. wheel base models equipped with tires 17x6.50. Stutz 145-inch wheelbase models have 20x7.00 tires.

TRAFFIC CLUB HOLDS ELECTION, HEARS BALDWIN ON TRUCK COMPETITION

Springfield, Mass., May 20.—Joseph A. Murphy was elected president of the Traffic Club of Springfield at its annual meeting in Hotel Kimball. Herbert L. Baldwin, publicity manager of the Boston & Maine Railroad, the speaker, dwelt on some of the problems confronting the railroads at the present time.

Other officers elected comprised: First vice-president, C. W. Hudson; second vice-president, W. C. Metcalf; secretary-treasurer, G. T. Smith, and board of governors, G. E. Boss, E. C. Chapman and H. J. Cummings.

Mr. Baldwin opened his address with the declaration that the railroads' problem today is everybody's business. He pointed out that the Boston & Maine ranks as one of the largest business institutions in New England, with 16,500 employees, a property investment of approximately $270,000,000, an annual pay roll of about $30,000,000, deposits about $300,000 daily in New England banks, and pays taxes amounting to about $10,000 daily. Since 1823 more than $100,000,000 has been spent by this New England railroad in improvements.

"The secret of the low rate of the trucks is that they do not pay all their operating costs. You pay part of them," he said.

"When your goods are shipped by railroad and you receive your bill you know exactly what you are paying. The price is all on your freight bill.

"But when you receive a bill from your motor truck shipment we contend, and we think you will agree, that the price is not all on the bill. You are paying it in some other way."

STUDEBAKER DISTRIBUTOR IN YOUNGSTOWN APPOINTED

Youngstown, May 20.—The Franklin-Youngstown Company has become distributor in Youngstown for the Studebaker Corporation, E. A. Molenski, president of the Youngstown firm, announces. Cliff Daubenmire and Mark Ohl will have charge of Studebaker sales. Molenski has been in the automobile business for fifteen years, including three as distributor for Franklin.

Notice

Please see the fifth column to the left, giving steering gear information. Notice the outstanding Ross predominance. This preference for Ross exists not only in the passenger car field, but in the truck and bus field and other divisions of the automotive industry as well. Passenger car figures are:

ROSS
27
★
FIRST Competitor
19
★
SECOND Competitor
13
★
THIRD Competitor
2
★
Build Their Own
10

ROSS
CAM AND LEVER STEERING
Roller Mounted
★
206
Engineering Staffs Prefer Ross

Secure another source of Profit

ONE LINE IS NOT ENOUGH
TAKE ON DE VAUX
GET *PROFIT NOW* AND INSURE YOUR FUTURE

Do something . . . *right away* . . . to get the sales you need. Rapid Turnover is the only way to change loss to profit. Others ★ in your circumstances . . . with one line and reduced sales . . . have solved the problem by taking on De Vaux. They are operating this ideal companion franchise with very slight increase in overhead . . . and with small capital requirements . . .

The Books of De Vaux Dealers Show . . .

Trade-in Cars of Low Price and Standard Make Taken At Profit Prices (No Trading Competition) • Low Pre-Service and "Free" After-Service Costs — $5.00 per car, last year's average • Negligible Service Requirements; No Need For Large Parts Stocks • Small Capital Requirements; no need for expensive set-up and high-rent buildings.

You Deal With An Old Friend — "Continental" — Builder of the Famous "Red Seal" Continental Motor

★ — *Among recent distributor appointments:* —

LOS ANGELES - - - - - Franklin Motors, Inc.
GRAND RAPIDS - - Ted Booth Motor Company (Packard and Nash)
KANSAS CITY - - - Berryman Reo Company
DAYTON - - - - - - - Harley H. Barton
SPRINGFIELD, OHIO - - - Ripley-Grisso Auto Co.

Write for names of other appointments.

CONTINENTAL
DE VAUX

BUILT BY CONTINENTAL
POWERED BY CONTINENTAL

With the New De Vaux 80 *they are*

— selling to the Big Market (96% of all cars now sold are priced below $1000).

— receiving additional advertising and publicity (Floor Play).

— offering customers desirable cars to fit smaller means

— not selling against their present lines, because Continental-De Vaux is one of America's seven non-affiliated manufacturers (no families of cars).

You get wholesale coverage with your De Vaux franchise

Prices start at **$725** f. o. b. factory

R. H. MULCH, General Sales Manager
Continental-De Vaux Company,
Grand Rapids, Michigan

Dear Sir:

Send me complete details regarding the 1932 De Vaux Franchise.

Name _____

Address _____

Now Handling _____

ADNM